=> d his

(FILE 'HOME' ENTERED AT 09:46:20 ON 26 JUN 2007)
FILE 'CA' ENTERED AT 09:46:31 ON 26 JUN 2007
L1 209 S BIOIMPED?
L2 488 S TISSUE(6A)(DIELECTRI? OR IMPED? OR ELECTRICAL(1A)CONDUCT? OR PERMITTIV?)
L3 157 S (CANCER? OR MALIGN? OR BENIGN)(6A)(DIELECTRI? OR IMPED? OR ELECTRICAL (1A)CONDUCT? OR PERMITTIV?)
L4 424 S L1-3 AND PY<2000
L5 12 S L4 AND ELECTROMAGNET?
L6 2 S L4 AND ANTENNA
L7 39 S L4 AND(RADIOWAVE OR RADIO WAVE OR MICROWAVE OR MICRO WAVE OR MHZ OR MEGAHERTZ OR MEGAHZ OR (MEGA OR M OR GIGA OR G)(W)(HERTZ OR HZ) OR GHZ OR GIGAHZ OR GIGAHERTZ OR MHERTZ OR GHERTZ OR RADIOFREQUENC? OR RF OR(RADIO OR CHARACTERISTIC)(2A)FREQUENCY OR RADIOMET?)
L8 35 S L1/TI
L9 81 S L2/TI
L10 20 S L3/TI
L11 83 S L4 AND L8-10
L12 15 S L4 AND REFLECT?
L13 120 S L5-7,L11-12
FILE 'BIOSIS' ENTERED AT 10:09:43 ON 26 JUN 2007
L14 761 S L13
L15 42 S L14 AND(MULTIFREQUENC? OR (MULTI OR MULTIPLE OR SEVERAL OR PLURAL?)(1A)FREQUENC? OR HARMONIC? OR COHERENT)
FILE 'MEDLINE' ENTERED AT 10:15:56 ON 26 JUN 2007
L16 613 S L13
L17 31 S L16 AND(MULTIFREQUENC? OR (MULTI OR MULTIPLE OR SEVERAL OR PLURAL?)(1A)FREQUENC? OR HARMONIC? OR COHERENT)
FILE 'CA, BIOSIS, MEDLINE' ENTERED AT 10:18:10 ON 26 JUN 2007
L18 170 DUP REM L13 L15 L17 (23 DUPLICATES REMOVED)

=> d bib,ab,kwic l18 1-170

L18 ANSWER 11 OF 170 CA COPYRIGHT 2007 ACS on STN
AN 130:248972 CA
TI Time domain **reflectometry**: measurement of free water in normal lung and pulmonary edema
AU Miura, Nobuhiro; Shioya, Sumie; Kurita, Daisaku; Shigematsu, Teruyoshi; Mashimo, Satoru
CS Department of Internal Medicine, Tokai University School of Medicine, Isehara, Kanagawa, 259-1193, Japan
SO American Journal of Physiology (**1999**), 276(1, Pt. 1), L207-L212
AB The free water content of lung **tissue** was investigated by **dielec.** spectroscopy in normal lungs and in pulmonary edema induced by oleic acid in rats. The dielec. relaxation in a frequency range of 107 to 1010 Hz was measured with the time domain **reflectometry** method at 25°. Three dielec. relaxation processes were analyzed for the lung tissue. A high-frequency process around 10 **GHz** was attributed to the orientation of free water mols. based on the relaxation time [log τh (in s) = -11.03]. The dielec. strength (ΔE) of this high-frequency peak (Δεh) should **reflect** the amt. of free water in the tissue. Because the measured Δεh depended on the air content of the lung samples, the value

of Δεh was cor. for the air content of each sample as detd. by the point-counting method in the area where the time domain **reflectometry** data were obtained. The lungs of rats that received an injection of oleic acid had a significantly increased free water content [(ΔεAEh of lung/Δε of pure water) × d. of pure water] compared with that in the normal lung (0.76 vs. 0.59 g/cm3). These results indicate that free water occupies □60% of the total vol. of normal lung tissue and that there is an increase in free water in pulmonary edema.

L18 ANSWER 51 OF 170 CA COPYRIGHT 2007 ACS on STN
AN 127:290043 CA
TI In vivo dielectric analysis of free water content of biomaterials by time domain **reflectometry**
AU Naito, Satoru; Hoshi, Masato; Mashimo, Satoru
CS Biological Science Laboratories, Kao Corporation, Tochigi, 321-34, Japan
SO Analytical Biochemistry (**1997**), 251(2), 163-172
AB A method of in vivo anal. of the free water content in living organisms by dielec. anal. in the time domain is described. Human skin is chosen as an example of living tissue. The cells suitable for the measurement of various layers of human skin and calcn. procedures for the waveform **reflected** from the probe end are described. The approach was confirmed to be effective for the detn. of the water content through measurement of the std. samples, keratin-water mixts. This method was also applied to human skin in vivo. Water content data measured with a probe specially designed for surface layer anal. were sensitive to humidity around the subject. The formula expressing the relation between the elec. field character of the probe, the permittivity depth profile, and the measured permittivity was used to analyzed the water content profile as a function of the depth from the skin surface. The use of several kinds of probes, differing in their elec. field characteristics, permitted evaluation of the water content depth profile of human skin. This procedure is easy and applicable to any sample due to its simplicity. The measurement needs only a touch of the probe on a sample spot. It is therefore a promising method of physicochem. research on living organisms and biomaterials.

L18 ANSWER 69 OF 170 BIOSIS on
AN 1997:71001 BIOSIS
TI Broadband quasi-differential **multifrequency** electrical impedance imaging system.
AU Riu, P. J.; Bragos, R.; Rosell, J.
CS Dep. Enginyeria Electronica, Univ. Politecnica Catalunya, c/Gran Capita s/n-Modul C4, E-08034 Barcelona, Spain
SO Physiological Measurement, (**1996**) Vol. 17, No. SUPPL. 4A, pp. A39-A47.
AB Dynamic and **multifrequency** imaging methods have been demonstrated both theoretically and experimentally. **Multifrequency** methods are able to produce images of static structures inside the measured object. Data collection systems, however, are affected by errors due to their non-ideal frequency behaviour. If the frequencies used in the measurement were close enough, the system would behave in almost the same way. In this case, however, the **impedance** change displayed by biological **tissues** is small, so the situation is similar to dynamic imaging. We call this method the quasi-differential imaging method. We have designed and

built an instrument able to apply signals from 1 kHz to 1 **MHz**, with frequency increments of 10 Hz. Patient interface circuits and demodulators were designed to display a flat response in the full frequency range of operation. Signals are digitized with 16 bit resolution and sent to the host computer using a high-speed serial interface. This allows a maximum measurement speed of about 8 images/s. All the system parts were full characterized out of the system and the results of these measurements are given as an indication of the limits of its use as a quasi-static imaging or quasi-differential imaging data collection system.

L18 ANSWER 86 OF 170 BIOSIS on STN
AN 1994:365691 BIOSIS
TI Single-plane **multifrequency** electrical impedance instrumentation.
AU Record, Paul M.
CS Univ. Keele, Sch. Post Graduate Med., Dep. Biomed., Eng. Med. Physics, Hospital Centre, Thornburrow Dr., Hartshill, Stoke ST4 7QB, UK
SO Physiological Measurement, (**1994**) Vol. 15, No. SUPPL. 2A, pp. A29-A35.
AB When tissue interacts with **electromagnetic** radiation is exhibits resistivity and permittivity changes, which decrease with frequency. Above 100 kHz it is expected that **dielectric** changes in **tissue** (**permittivity**) will allow one to distinguish damaged and necrotic tissue. Furthermore, **tissue impedance** at medium frequencies (100 kHz-1 **MHz**) have not been well characterized. The aim of this work was to design instrumentation for an impedance tomographic spectrometer to cover the minimum band 10 kHz-1 **MHz**. In order to produce images sensitive to small changes in resistivity, voltage measurement must be accurate to at least 0.1%. Using commercially available operational amplifiers, PSPICE simulations demonstrated 0.1% accuracy up to 800 kHz, falling off to 0.5% at 1 **MHz**. Implementation achieved a reasonable flat amplitude (+-0.5 dB) and a phase shift of 50 degree from 10 kHz to 3 **MHz** and a receive response of 0.13 dB to 5 **MHz** and phase shift of -40 degree at 3 **MHz**. With channel correction this design will provide useful readings up to 3 **MHz**.

L18 ANSWER 88 OF 170 BIOSIS on STN
AN 1993:502246 BIOSIS
TI The frequency dependent FDTD method for **multi-frequency** results in **microwave** hyperthermia treatment simulation.
AU Pontalti, Rolando; Cristoforetti, Luca; Cescatti, Lorenza
CS Ist. per la Ricerca Scientifica Tecnol., 38050 Povo, Trento, Italy
SO Physics in Medicine and Biology, (**1993**) Vol. 38, No. 9, pp. 1283-1298.
AB Among the techniques for speeding up the optimal parameter achievement processes in hyperthermia treatment planning, pulse excitation in the FDTD (finite-difference time-domain) method plays an important role because it provides **multi-frequency** results with a single run of the code. The introduction of the frequency dependent FDTD ((FD)-2TD) method has also recently provided a means to accurately deal with dispersive tissues on the condition that they have a first-order permittivity. In this paper, a multi-relaxation (FD)-2TD approach which can improve the match between actual and simulated **tissue permittivities** is presented. A comparisonof ordinary FDTD, triple-relaxation (FD)-2TD and analytical results in a muscle cylinder struck by a TM plane wave

demonstrates the errors caused in the early **multi-frequency** approaches by using average permittivity values. An example of the calculation of absorption rate density (ARD) distributions in a patient-specific model of a head/neck tumour managed by a waveguide applicator is reported. Some secondary refinements of the method, such as the use of dispersive absorbing boundary conditions and a field-equivalence theorem for separating applicator from tissuecalculations, are also discussed.

L18 ANSWER 98 OF 170 BIOSIS on STN
AN 1992:54323 BIOSIS
TI **ELECTROMAGNETIC** PULSED-WAVE RADIATION IN SPHERICAL MODELS OF DISPERSIVE BIOLOGICAL SUBSTANCES.
AU MOTEN K [Reprint author]; DURNEY C H; STOCKHAM T G JR
CS ELECTRICAL ENGINEERING DEP, UNIV UTAH, SALT LAKE CITY, UTAH 84112, USA
SO Bioelectromagnetics, (**1991**) Vol. 12, No. 6, pp. 319-334.
AB In analytical studies, we investigated induced-field patterns and SAR distributions in a lossy, dispersive, homogeneous, **dielectric** sphere typical of muscle **tissue** as irradiated by a plane-wave pulse train consisting of a pulse-modulated sinusoidal carrier wave. Calculations were made for carrier frequencies of 1, 3, and 15 **GHz**, pulse widths of 0.333, 2.0 and 4 ns, and pulse repetition rates of 1.11 × 106, 100 × 106, and 181.18 × 106 pps. The classical Mie solution was modified for a train of incident pulses that was represented by a Fourier series, and the fast-Fourier transform was used to sum the series. Computationally, the technique proved to be feasible and less expensive than we expected. The calculated field patterns show that the sphere's physical dimensions and the internal wavelength of the carrier greatly influence the nature of pulse-train progagation in the sphere. **Harmonics** having internal wavelengths nearly equal to the radius of the sphere produce most of the absorption; other **harmonics** produce little absorption. An intense hot spot is observed in spheres with radii that match the carrier's wavelengths.

L18 ANSWER 99 OF 170 CA COPYRIGHT 2007 ACS on STN
AN 115:206017 CA
TI The dielectric permittivity at **radio frequencies** and the Bruggeman probe: novel techniques for the on-line determination of biomass concentrations in plant cell cultures
AU Markx, Gerard H.; Davey, Christopher L.; Kell, Douglas B.; Morris, Phillip
CS Dep. Biol. Sci., Univ. Coll. Wales, Aberystwyth/Dyfed, SY23 3DA, UK
SO Journal of Biotechnology (**1991**), 20(3), 279-90
AB A novel technique is described for the measurement of the vol. fraction of biomass in a suspension by the simultaneous measurement of the cond. of a suspension contg. cells and of the medium in which the cells are suspended. The presence of non-conducting particulate matter in a suspension will cause the cond. of a suspension to be decreased relative to that of the medium in which the particles are suspended. A simple equation (the Bruggeman equation) describes the relation between the vol. fraction of non-conducting particulate matter and the decrease in cond. The accuracy of this method for the detn. of the biomass concn. of plant cells (Festuca arundinacea) in culture was shown. The method was successfully applied to the online detn. of biomass concns. during

the growth of F. arundinacea cultures and gave good agreement with biomass levels as detd. from measurements of the **radio-frequency** dielec. permittivity of such cultures.

L18 ANSWER 107 OF 170 BIOSIS on STN
AN 1988:337228 BIOSIS
TI THE INFLUENCE OF TISSUE LAYERING ON **MICROWAVE** THERMOGRAPHIC MEASUREMENTS.
AU HAWLEY M S [Reprint author]; CONWAY J; ANDERSON A P; CUDD P A
CS DEP MED PHYSICS AND CLINICAL ENGINEERING, WESTON PARK HOSP, WHITHAM ROAD, SHEFFIELD S10 2SJ, UK
SO International Journal of Hyperthermia, (**1988**) Vol. 4, No. 4, pp. 427-436.
AB Non-invasive thermal imaging and temperature measurement by **microwave radiometry** has been investiated for medical diagnostic applications and monitoring hyperthermia treatment of cancer, in the context of heterogeneous body structure. The temperature measured by a **radiometer** is a function of the emission and propagation of **microwaves** in tissue and the receiving characteristics of the **radiometric** probe. Propagation of **microwaves** in lossy media was analysed by a spectral diffraction approach. Extension of this technique via a cascade transmission line model profives an efficient algorithm for predicting the field patterns of aperture **antennas** contacting multi-layered tissue. A **coherent** radiative transfer analysis was used to relate the field pattern of a radiating **antenna** to its receiving characteristics when used as a **radiometer** probe, leading to a method for simulating **radiometric** data. Measurements and simulations were used to relate the field pattern of a radiating **antenna** to its receiving characteristics when used as a **radiometer** probe, leading to a method for simulating **radiometric** data. Measurements and simulations were used to assess the effect of overlying fat layers upon **radiometer** response to temperature hot spots in muscle-type media. Results suggest that **dielectric** layering in **tissue** greatly influences measured temperatures and should be accounted for in the interpretation of **radiometric** data.

L18 ANSWER 110 OF 170 CA COPYRIGHT 2007 ACS on STN
AN 107:231800 CA
TI Dielectric relaxation time and structure of bound water in biological materials
AU Mashimo, Satoru; Kuwabara, Shinichi; Yagihara, Shin; Higasi, Keniti
CS Dep. Phys., Tokai Univ., Hiratsuka, 259-12, Japan
SO Journal of Physical Chemistry (**1987**), 91(25), 6337-8
AB The **dielec**. behavior of living **tissues** and a no. of biol. materials was examd. by new equipment of the time domain **reflectometry** method in a wide frequency range (107-1010Hz). Two peaks of Debye absorption around 100 **MHz** and 20 **GHz** were found for all the materials. The low-frequency absorption is probably due to bound water, whereas the high-frequency absorption to free water. From the obsd. relaxation times of bound water, a hypothesis is ventured on the structure of bound water and its relaxation mechanism.

L18 ANSWER 112 OF 170 CA COPYRIGHT 2007 ACS on STN
AN 107:195148 CA

TI The **dielectric** properties of biological **tissue** (Crassula portulacea) from 10-2 to 109 Hz
AU Broadhurst, M. G.; Chiang, C. K.; Wahlstrand, K. J.; Hill, R. M.; Dissado, L. A.; Pugh, J.
CS Inst. Mater. Sci. Eng., Natl. Bur. Stand., Gaithersburg, MD, 20899, USA
SO Journal of Molecular Liquids (**1987**), 36, 65-73
AB Dielec. data from 10-2 Hz to 109 Hz are given for fresh leaves of C. portulacea (Jade plant), liq. extd. from such leaves and extd. liq. contg. a synthetic polymer film. Features assocd. with the bulk electrotype, the cell walls and the elec. double layer at the electrode of the specimen holder are clearly delineated in the data. A synthetic film produced interfacial polarization that appears quite similar to that due to cell walls. Interpretation of the data is given in terms of ionic movement through the leaf structure. The obtained data are intended to be a prototype for live tissue data and used, for example, to design synthetic dielec. phantom materials.

L18 ANSWER 113 OF 170 CA COPYRIGHT 2007 ACS on STN
AN 107:194177 CA
TI Dielectric phantoms for **electromagnetic** radiation
AU Broadhurst, M. G.; Chiang, C. K.; Davis, G. T.
CS Inst. Mater. Sci. Eng., Natl. Bur. Stand., Gaithersburg, MD, 20899, USA
SO Journal of Molecular Liquids (**1987**), 36, 47-64
AB The design and performance are described of a synthetic material that has the same dielec. heating characteristics as living muscle in the 1-1000 **MHz** frequency range. This dielec. phantom is a combination of the following 4 components: (1) a 50/50 soln. of ethylene carbonate and propylene carbonate chosen to have the same dielec. const. as water: (2) an org. salt to provide the same cond. as biol. electrolytes: (3) flakes of polyethylene terephthalate to provide the interfacial polarization that occurs at cell walls in biol. tissue; and (4) an inorg. and/or polymeric gelling agent to provide mech. rigidity. The resulting composite material is more stable to biol. attack and drying than are existing aq. based phantom materials, and its dielec. properties are more closely matched to those of natural tissues over most of the frequency range of 1-1000 **MHz**.

L18 ANSWER 116 OF 170 CA COPYRIGHT 2007 ACS on STN
AN 101:101851 CA
TI **Permittivity** of mammalian **tissues** in vivo and in vitro. Advances in experimental techniques and recent results
AU Stuchly, Maria A.; Stuchly, Stanislaw S.
CS Radiat. Prot. Bur., Health Welfare Canada, Ottawa, K1A 0L2, Can.
SO International Journal of Electronics (**1984**), 56(4), 443-56
AB A review, with 30 refs., of recent advances in exptl. techniques for detg. the **dielec. permittivity** of biol. **tissues** and of **radio-** and **microwave-frequency** data.

L18 ANSWER 122 OF 170 CA COPYRIGHT 2007 ACS on STN
AN 95:129927 CA
TI **Dielectric** properties of biological **tissue** and biophysical mechanisms of **electromagnetic**-field interaction
AU Schwan, H. P.

CS Dep. Bioeng., Univ. Pennsylvania, Philadelphia, PA, 19104, USA
SO ACS Symposium Series (**1981**), 157(Biol. Eff. Nonioniz. Radiat.), 109-131
AB A review with 61 refs.

L18 ANSWER 123 OF 170 CA COPYRIGHT 2007 ACS on STN
AN 95:164324 CA
TI Variation of **dielectric** properties of **tissues** as a function of water content
AU Foster, K. R.; Schepps, J. L.; Schwan, H. P.
CS Dep. Bioeng., Univ. Pennsylvania, Philadelphia, PA, 19104, USA
SO Studia Biophysica (**1981**), 84(1), 31-3
AB A discussion is given of the dielec. properties of single muscle cells of the giant barnacle Balanus nubilus and various tissues of dogs as a function of water content. The nearly identical dielec. and motional properties of ≥90% of tissue water to those of the bulk fluid, the contribution of water to the **permittivity** of the **tissues** as reduced by water bound to macromols. in soln., and the ionic cond. of the aq. phase of the cytoplasm are discussed.

L18 ANSWER 124 OF 170 CA COPYRIGHT 2007 ACS on STN
AN 94:45322 CA
TI The UHF and **microwave dielectric** properties of normal and tumor **tissues**: variation in **dielectric** properties with **tissue** water content
AU Schepps, Jonathan L.; Foster, Kenneth R.
CS Dep. Bioeng., Univ. Pennsylvania, Philadelphia, PA, 19104, USA
SO Physics in Medicine & Biology (**1980**), 25(6), 1149-59
AB Dielec. measurements were made on various soft tumor and normal tissues between the frequencies of 0.01 and 17 **GHz** at body temp. At **microwave** frequencies above 1-5 **GHz**, the **tissue dielec.** properties can be fitted to Debye equations with the same relaxation frequency (25 **GHz**) as found for pure water at 37°. The **tissue dielec.** properties correlate well with their water contents. The cond. of the tissue at 0.1 **GHz** (which is close to that of the cytoplasm itself) increases with the vol. fraction of water in the tissue, in a manner consistent with that previously obsd. in proteins suspended in electrolyte soln. The contribution of the **tissue** water to the **tissue dielec. permittivity** at frequencies below 1 **GHz** is fitted by a function of water content different to that describing the cond. data. Empirical equations that may be used to predict the **dielec.** properties of other soft **tissues** within this wide frequency range are suggested.

L18 ANSWER 125 OF 170 CA COPYRIGHT 2007 ACS on STN
AN 93:40758 CA
TI In vivo probe measurement technique for determining dielectric properties at VHF through **microwave** frequencies
AU Burdette, Everette C.; Cain, Fred L.; Seals, Joseph
CS Eng. Exp. Stn., Georgia Inst. Technol., Atlanta, GA, 30332, USA
SO IEEE Transactions on Microwave Theory and Techniques (**1980**), MTT-28(4), 414-27
AB A novel probe technique for the detn. of **dielec.** properties of semisolid materials and living **tissues** in situ is described exptl. and theor. This method, based on an **antenna** modeling theorem, offers unique advantages over conventional dielec. measurement techniques including (1) an

ability to perform living (in vivo) **tissue dielec.** measurements, (2) elimination of the need for tedious sample prepn., (3) the ability to obtain continuous dielec. property data from < 0.1 **GHz** to > 10 **Ghz**, and (4) the ability to process data on a real time basis. Results of system performance evaluation via measurements of std. liq. **dielec.** and in vivo **tissue** data are presented.

L18 ANSWER 132 OF 170 CA COPYRIGHT 2007 ACS on STN
AN 88:34029 CA
TI **RF** dielectric properties measurement system: human and animal data
AU Toler, J.; Seals, J.
CS Syst. Tech. Lab., Georgia Inst. Technol., Atlanta, GA, USA
SO DHEW (NIOSH) Publication (United States) (**1977**), 77-176, 79 pp.
AB A system was evaluated for accurately and reproducibly measuring the elec. properties (relative dielec. const. and cond.) of materials used in phantom modeling research. The frequency range of interest was 10-100 **MHz**. The system is based on an **antenna** modeling theorem that relates the impedance of a short monopole **antenna** in air to its impedance in dielec. media with high **radiofrequency** power absorption such as phantom modeling materials and biol. tissues. Implementation of the system resulted in an equipment configuration consisting of a signal source, network analyzer, and small in vivo probe. Accuracy and reproducibility of the system were demonstrated by comparing measured elec. property data with corresponding ref. data published in the literature. Sample materials used in this data comparison were std. liqs. (water, MeOH, ethylene glycol, and saline solns.) and phantom modeling materials. Both discrete and swept frequency measurements were made, and accuracies within ±5% were demonstrated.

L18 ANSWER 133 OF 170 CA COPYRIGHT 2007 ACS on STN
AN 91:206003 CA
TI Molecular absorption of non-ionizing radiation in biological systems
AU Straub, Karl David
CS Dep. Med., VA Hosp., Little Rock, AR, 72206, USA
SO Phys. Basis Electromagn. Interact. Biol. Syst., Proc. Workshop (**1977**), 35-42. Editor(s): Taylor, Leonard S.; Cheung, Augustine Y. Publisher: NTIS, Springfield, Va.
AB Absorption of **electromagnetic** radiation by biomols., cells, and **tissues** is discussed, with the **dielec.** properties of the absorbing medium being studied to det. the mechanism of absorption.

L18 ANSWER 143 OF 170 CA COPYRIGHT 2007 ACS on STN
AN 73:94708 CA
TI Frequency dependence of the dielectric parameters of biological substances
AU Gorpinchenko, I. M.
CS Mosk. Gos. Univ. im. Lomonosova, Moscow, USSR
SO Biologicheskie Nauki (Moscow) (**1970**), (6), 46-52
LA Russian
AB Frequency dependence of **dielec.** penetration of a no. of animal **tissues**, esp. liver, muscle, and centrifuged blood, was studied at 150-600 **MHz**. Measurements were made on a coaxial measuring line with the use of a circular diagram, which ensured an accuracy not below 15%. Measurements

were made at 150, 200, 300, 400, 500, and 600 **MHz**. The dispersion of elec. penetrability obtained, with decreasing slope in the short-wave region, had the same character for all the tissues measured. Frequency dependence (dispersion) of **dielec**. penetrability and **elec. conductivity** of the **tissues** in the range studied was controlled by univalent **tissue** electrolytes NaCl and KCl, while **dielec**. parameters of divalent ions, due to their low concns., did not change with the frequency. The dispersion of the polarization of tissues depended above all on dipole properties of the electrolytes.

=> log y
STN INTERNATIONAL LOGOFF AT 10:19:39 ON 26 JUN 2007